

630.7

In2b

no.71

cop. ~~4~~5

UNIVERSITY OF
ILLINOIS LIBRARY
AT URBANA-CHAMPAIGN
AGRICULTURE



Digitized by the Internet Archive
in 2016 with funding from
University of Illinois Urbana-Champaign Alternates

<https://archive.org/details/bulletin7118purd>

✓

Crop Production
PURDUE UNIVERSITY UNIVERSITY OF ILLINOIS
AGRICULTURE LIBRARY

Agricultural Experiment Station

Circulating copy

Agricultural Library

BULLETIN No. 71, VOL. IX.

JUNE, 1898.

-
- I. Corn Meal and Shorts as Food for Pigs.
 - II. Skim Milk as Food for Young Growing Chickens.

PUBLISHED BY THE STATION:

LaFayette, Indiana,

U. S. A.

BOARD OF CONTROL.

JAMES H. SMART, L. L. D., President of the University.	
CHARLES B. STUART, (President Trustees)	
	LaFayette, Tippecanoe Co.
WILLIAM A. BANKS,	LaPorte, LaPorte Co.
SYLVESTER JOHNSON	Irvington, Marion Co.
DAVID E. BEEM	Spencer, Owen Co.
JOB H. VANNATTA,	LaFayette, Tippecanoe Co.
BENJAMIN HARRISON	Indianapolis, Marion Co.
WILLIAM H. O'BRIEN	Lawrenceberg, Dearborn Co.
JAMES M. BARRETT	Fort Wayne, Allen Co.
JOHN MARTIN	Brookville, Franklin Co.

STATION STAFF.

Charles S. Plumb, B. S.,	Director
William C. Latta, M. S.,	Agriculturist
James Troop, M. S.,	Horticulturist
Henry A. Huston, A. M., A. C.,	Chemist
Joseph C. Arthur, D. Sc.,	Botanist
Arvill W. Bitting, D. V. M.,	Veterinarian
William Stuart, M. S.,	Ass't Botanist
Wm. B. Anderson, B. S.,	Ass't Agriculturist

The Station will take pleasure in sending its publications, free, to all citizens of the State, who may be interested in them.

Address, DIRECTOR EXPERIMENT STATION,
LAFAYETTE, IND.

BULLETINS OF 1898 ISSUED TO DATE.

- No. 68. The sugar beet in Indiana. March.
- No. 69. Insecticides, fungicides and spraying. March.
- No. 70. The relation of water supply to animal diseases. May.
- No. 71. (1) Feeding pigs corn meal and shorts. (2) Skim milk for chickens. June.

Corn Meal and Shorts as Food for Pigs.

BY C. S. PLUMB AND W. B. ANDERSON.

Many feeding experiments have been conducted upon swine, both in the United States and Europe, some few of which have been in the same field as the one herewith reported on. This is a comparison of results secured from feeding a mixture of corn meal and wheat shorts to one lot of pigs, and pure corn meal to another lot.

The pigs used were six sows, five and one-half months old, at the beginning of the experiment. They were divided as evenly as possible into two lots of three each. The pigs were high grade Chester Whites, and were bred on the Station farm. The pigs in lot I, the shorts-corn meal ones, were Nos. 138, 142 and 143, while those of lot II, the corn meal ones, were 139, 166 and 168.

The pigs were weighed every Saturday in the afternoon, and for four days preceding the experiment they were weighed daily, and the average of these four days' weights is taken for the average weight of each pig at the beginning of the experiment, which extended from December 25, 1897, to March 5, 1898, or 70 days.

The pens in which the pigs were kept are of much the same size, being about 30x15 feet, with a comfortable small shelter house in each lot. While the weather was such as to cause the pens to be muddy more or less, they were kept in good sanitary condition by frequent cleaning and bedding.

In this experiment seven days or a week is termed a period.

The following table (I) gives the weights of the pigs from the beginning to the end of the experiment, the total gain in weight for each pig and for the three of each lot, the average daily gain for each animal and for each lot, and the average daily gain per head per lot.

An examination of this table shows that those fed the mixture of shorts and corn meal gained a total of 353½ pounds, while the corn meal lot gained but 326¾ pounds. It will be also noticed that the three pigs of lot I made a combined daily growth of 5.05 pounds, or an average of 1.68 pounds per pig, as compared with 4.66 pounds for lot II, or an average of 1.55 pounds per pig.

TABLE I.

Weights of Pigs.

Date	Lot I. Shorts-corn meal				Lot II. Corn meal			
1897-1898	No. 138	No. 142	No. 143	Total	No. 139	No. 166	No. 168	Total
Dec. 25.	139.25	115.	133.25	387.5	117.25	145.25	123.25	385.75
Jan. 1.	152.	127.5	149.5	429.	126.	163.	134.	423.
" 8.	167.5	136.5	164.5	468.5	136.5	179.	149.5	465.
" 15.	178.	150.	180.	508.	150.	190.	158.5	498.5
" 22.	191.	160.	198.	549.	151.5	200.5	166.	518.
" 29.	201.	164.	201.5	566.5	157.5	209.	177.	543.5
Feb. 5.	209.	180.	216.5	605.5	166.	221.	185.5	572.5
" 12.	223.	192.	227.	642.	177.5	240.	198.	615.5
" 19.	233.	200.	237.	670.	188.5	251.	207.5	647.
" 26.	241.5	213.5	249.	704.	195.	260.5	216.5	672.
Mar. 5.	253.	223.5	264.5	741.	203.5	279.	230.	712.5
Total gain in weight.	113.75	108.5	131.25	353.5	85.25	133.75	106.75	326.75
Average daily gain...	1.62	1.55	1.87	5.05	1.21	1.91	1.52	4.66
Average daily gain per head per lot	1.68				1.55			

Attention is here called to the fact, however, that the heaviest and lightest pigs were in lot II, from first to last, and while none of the animals in either lot were sick during the experiment, unless in a very incidental way, pig 139 did not prove as good a grower as the rest of the pigs. But even had she laid on 25 pounds more flesh, lot II would still have fallen slightly below lot I in total weight.

From the practical feeders' standpoint these pigs made uncommonly good gains. Where five of six animals of this class average in daily gain for 70 days from one and one-half to nearly two pounds each, it may be considered a very satisfactory showing.

The foods used were a mixture of equal parts by weight of wheat shorts and corn meal fed lot I, while lot II was fed corn meal

only. The grain was weighed out and mixed with warm but not hot water. Besides this, drinking water, salt and ashes were supplied freely to each pen.

The pigs were fed about seven in the morning and five in the afternoon, and once or twice in severely cold weather at noon.

The following table (II) shows the amount of food eaten during each period by each lot, the total amount by each lot, and the average amount per day per lot and pig. The food was weighed out for the three pigs in each lot, which ate together from one trough. The figures of the average amount eaten per day per pig are on the assumption that each pig ate one-third of that placed in the trough. This is in fact not so, but in no other way can we secure an estimate of the amount eaten daily by each pig, unless the animal is kept by itself and the food weighed separate.

The table shows that lot I was fed 718 pounds of shorts and the same amount of corn meal, making a total of 1436 pounds of the mixture, while lot II was fed 1413 pounds of corn meal.

The pigs of lot II did not at all times eat with as good an appetite as did those of lot I, and especially so on two different occasions.

TABLE II.

Total pounds food eaten by pigs. In periods,

1897 1898	LOT I Shorts-Corn meal			LOT II Corn meal
Period	Shorts	Corn meal	Total grain	Corn meal
I	62.	62.	124	124.
Dec. 25-Jan. 1				
II	68.5	68.5	137.	137.
Jan. 1-8				
III	73.5	73.5	147.	140.
Jan. 8-15				
IV	73.5	73.5	147.	131.
Jan. 15-22				
V	71 5	71 5	143.	141.
Jan. 22-29				
VI	71.5	71.5	143.	145.
Jan. 29-Feb. 5				
VII	73.5	73.5	147.	147.
Feb. 5-12				
VIII	73.5	73.5	147.	147.
Feb. 12-19				
IX	73.5	73.5	147.	147.
Feb. 19-26				
X	77.	77.	154.	154.
Feb. 26-Mch. 5				
Total.....	718.	718.	1436	1413
Average amount eaten per day per lot	10.25	10.25	20.51	20.18
Average amount eaten per day per pig	3.41	3.41	6.82	6.72

The cost of production is the feature of the experiment of most interest to the practical farmer.

A consideration of the figures given shows that the value of the food consumed, as based on LaFayette market quotations and what we paid for the shorts, is as follows:

LOT I

Was fed 718 pounds shorts at 70 cents 100 pounds.....\$5.03
 “ “ 718 “ corn meal “ 65 “ “ “ 4.67
Total value food eaten by lot I.....\$9.70

LOT II

Was fed 1413 pounds cornmeal at 65 cents 100 pounds.....\$9.18
 This shows a slightly greater value for the food fed lot I over lot II.

The cost of the food for each pound of gain was as follows:

LOT I

Cost of food \$9.70.
 Pounds of gain made 353.5.
 Cost of food for each pound of gain .0274 cents.
 Cost of each 100 pounds gain in weight \$2.74.

LOT II

Cost of food \$9.18.
 Pounds of gain made 326.75.
 Cost of food for each pound of gain .028.
 Cost of each 100 pounds gain in weight \$2.80.
 A further study of the work shows that in
 Lot I, 4.06 pounds shorts and corn meal produced one pound gain,
 Or 100 pounds of this mixture gave a gain of 24 6 pounds.
 In lot II, 4.32 pounds corn meal produced one pound of gain.
 Or 100 pounds of this food gave a gain of 23.1 pounds.

Relation of periods of heat or oestrus to gains in weight.

In this experiment, sows only were used, and as they were neither pregnant or suckling young, they came in heat at intervals during the feeding. During one or two of the periods, it was thought that owing to this condition, several of the sows did not gain in weight as they would have otherwise, and especially 139 and 168, a boar being placed near their pen for a few weeks. A comparison, however, of the periods of heat, with gains in weight, gives no conclusive evidence that this influence retards growth, though one might ordinarily suppose it would. For illustration, during the period ending Feb. 12, No. 139 was in heat from Monday till Thursday, yet she showed a gain during that week of 11½ pounds. Sow 168 was in heat from Tuesday till Friday, yet

he showed a gain of $12\frac{1}{2}$ pounds for the period. During the week ending Jan. 29, sows Nos. 142 and 143, in a pen away from the boar, were also in heat, and they made but small gains, one making four and the other three and one-half pounds for the week, yet we have no special evidence to show that being in heat was the cause of the light gains. In fact there were other weeks when the sows were not in heat, when they made but slightly larger gains over some of those when in heat, or even smaller.

A consideration of the weather conditions, shows these weeks to have been at least average ones for animal comfort.

The observations made therefore with these sows, give no substantial evidence, that the periods of heat or oestrus materially affects the gain in weight.

Skim Milk as Food for Young Growing Chickens.

BY W. B. ANDERSON.

The fowls used in this experiment were 20 young chickens, 10 Plymouth Rocks and 10 Houdans. They had, previous to the beginning of the experiment, been allowed to run at large together, getting the same feed, treatment and care. The chickens selected were not uniform in size, but large and small were equally divided between the two lots. They were taken from two sittings, one brood about two, and the other, one and one-half months old at the beginning of the experiment. The chickens were separated into two groups, known as lots I and II, with five of each breed in a lot.

The food, care and treatment of the two lots were identical, except that the fowls in lot II received in addition to the food given lot I, all the skim milk they would drink. Both lots were given all they would eat of a mixed food consisting of two parts crushed corn, one part bran and one part ground oats. They were fed three times a day, except on Sundays, when an increased amount of food was given at the morning and evening meal.

Weights were taken of the amounts of food given each lot, and of the refuse left from day to day. Both lots were given all they would consume of cracked bone, cabbage, lettuce and water, of which no record was kept. The weights of all foods and of the fowls were recorded in ounces.

The following table shows the weight of each chicken and the total weight of both lots, taken on July 11th, 1896, at the beginning of the experiment:

TABLE III.
Weights in ounces. July 11.

LOT I. Without milk		LOT II. With milk	
No. of chicken	Weight	No. of chicken	Weight
1	19	5	16
2	16.5	6	13
3	10.0	7	11
4	15.5	9	12
8	9.5	10	14.5
12	10.0	11	19.0
14	9.0	13	9.0
15	14.5	17	12.0
16	8.0	18	7.0
20	9.0	19	7.0
Total.....	121	Total.....	120.5

The above table shows a difference of one-half an ounce in favor of lot I at the beginning of the experiment.

Table IV shows the total food consumed for each week, and the weekly weights of fowls during the entire experiment of eight weeks.

TABLE IV.

Date	Ounces of food consumed			Weight of fowls	
	Lot I	Lot II		Lot I	Lot II
	Mixed feed	Mixed feed	Milk	Weight-oz.	Weight-oz.
July 18	182.5	285.5	39.0	131.5	152.0
" 25	273.0	301.5	85.5	156.0	178.0
Aug. 1	344.5	317.5	162.5	180.5	213.0
" 8	474.5	498.5	278.5	220.0	277.0
" 15	412.0	449.5	233.5	†216.5	319.0
" 22	384.0	514.5	299.5	†250.0	394.5
" 29	408.0	556.5	216.25	†270.0	437.0
Sept. 5	398.5	553.0	131.5	†297.5	476.5
Total food consumed	179 8 lb.	217 3 lb.	90 4 lb.		

†Combined weight of nine chickens.

No. 2 from lot I died August 18, leaving only nine in the lot.

From the above table it is shown that lot II consumed 37.5 pounds mixed feed more than lot I, and 90.7 pounds of milk besides.

In Table V is given the weekly gain for each lot and for each chicken during the experiment.

TABLE V.
Weekly gain per lot and per chicken.

Lot I. Without milk			Lot II. With Milk	
Date	Total gain	Average gain per chicken	Total gain	Average gain per chicken
July 18	10.5 oz.	1.05 oz.	31.5 oz.	3.15 oz.
" 25	24.5 "	2.45 "	26.0 "	2.60 "
Aug. 1	24.5 "	2.45 "	35.0 "	3.50 "
" 8	39.5 "	3.95 "	64.0 "	6.40 "
" 15	‡24.5 "	2.73 "	42.0 "	4.20 "
" 22	‡33.5 "	3.35 "	75.5 "	7.55 "
" 29	‡20.0 "	2.22 "	43.5 "	4.35 "
Sept. 5	‡27.5 "	2.75 "	39.5 "	3.95 "
Ave. gain per week		2.62 oz.		4.46 oz.

‡Combined weight of nine fowls.

From the table it will be seen that both lots made the greatest gains during the same weeks, viz: August 1 to 8, and 15 to 22, indicating that both lots were alike susceptible to favorable external conditions.

In lot I there was slow increase in average gain, and it was very irregular throughout the experiment.

In lot II the increase in average gain was much more rapid and continued for a longer period.

The mixed food consumed by the two lots during these periods, August 1 to 8, and 15 to 22, was greater in amount than during some of the other periods, while the amount of milk consumed was greatest during these weeks. From this it appears that the great increase of average gain of lot II over lot I during these periods, was largely due to the increased consumption of milk of that time,

From Tables IV and III it is also shown that during any period when there is an increased consumption of milk in lot II, there is a corresponding increase in the average gain during those periods and vice versa.

Table VI shows the weights of each chicken in lot I and II at the beginning of the experiment (July 11) and at its close (Sept. 5).

TABLE VI.

Lot I. Without milk			Lot II. With milk		
No. chicken	Weights		No. chicken	Weights	
	July 11	Sept. 5		July 11	Sept 5
1	19. oz.	43. oz.	5	16.0 oz	53.5 oz.
2	16.5 "	†	6	13.0 "	52.0 "
3	10.0 "	36.5 "	7	11.0 "	46.0 "
4	15.5 "	39.0 "	9	12.0 "	44.0 "
8	9.5 "	26.0 "	10	14.5 "	50.0 "
12	10.0 "	29.5 "	11	19.0 "	68.0 "
14	9.0 "	27.5 "	13	9.0 "	38.0 "
15	14.5 "	38.5 "	17	12.0 "	47.0 "
16	8.0 "	24.0 "	18	7.0 "	37.5 "
20	9.0 "	33.0 "	19	7.0 "	40.0 "

†Died August 18.

Summary.

1. If skim milk be added to the ration fed to young chickens it will increase the consumption of the other foods given.

2. The great increase in average gain was coincident with the periods when the greatest amount of skim milk was consumed.

3. Skim milk is especially valuable as a food for young chickens during the hot dry weather; and becomes of less importance as the chicken grows older and the weather becomes cooler.

Errata for bulletin No. 67.

Page 67. The cost per pound gain per lot in cents, \$4.57 should be \$4.80. This correction should be made in the third line from bottom of same page. On the fourth line from top of page 70, the same error should be corrected.

Page 66. The total gain of lot IV should be 443¼ instead of 442¼ lbs. The same correction should be made on page 67 in lot IV, showing pounds of gain made per lot.

Circulating copy
American Library

UNIVERSITY OF ILLINOIS-URBANA

630.71N2B C005
RESEARCH BULLETIN LAFAYETTE
71 1898



3 0112 019552188